



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

### DEPARTMENT OF CIVIL ENGINEERING

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/Week	Academic Year	Date of commencement of Semester
20CE5T02	DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES (R20)	V	Civil Engineering	5	2023-24	05-06-2024

**COURSE OUTCOMES:** Upon completion of the course, Students are able to

1	Work on different types of design philosophies. K2
2	Carryout analysis and design of flexural members and detailing. K3
3	Design structures subjected to shear, bond and torsion. K3
4	Design different type of compression members and footings. K3
5	Design of different types of slabs and detailing. K3

UNIT	OutComes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1: Work on different types of design philosophies. K2	1.1	Introduction to Reinforced concrete and reinforced concrete structures, Advantages and disadvantages of reinforced concrete	T1,R2	1	Chalk & Talk, PPT, Tutorial, Active learning
		1.2	Properties of concrete and steel	T1,R2	1	
		1.3	<b>Working stress method:</b> Design codes and handbooks, loading standards – Dead, live, wind and earthquake loads, Elastic theory: design constants, modular ratio	T1,R2	1	
		1.4	neutral axis depth and moment of resistance for	T1,R2	1	

			balanced, under-reinforced and over-reinforced sections.		
		1.5	Design of singly reinforced beams.	T1,R2	1
		1.6	Design of doubly reinforced beams.	T1,R2	1
		1.7	Limit State Design: Concepts of limit state design, Basic statistical principles	T1,R2	1
		1.8	Characteristic loads.	T1,R2	1
		1.9	Characteristic strength – Partial load and safety factors.	T1,R2	1
		1.10	Representative stress-strain curves for cold worked deformed bars and mild steel bars.	T1,R2	1
		1.11	Design of singly reinforced beams.	T1,R2	1
		1.12	Design of doubly reinforced beams.	T1,R2	1
<b>Total</b>					<b>12</b>

<b>II</b>	<b>Co2: Carryout analysis and design of flexural members and detailing. K3</b>	2.1	Limit state analysis and design of singly reinforced sections	T1,R2	1
		2.2	Effective depth, Moment of Resistance.	T1,R2	1
		2.3	Minimum depth for a given capacity, Limiting Percentage of Steel		
		2.4	Minimum Tension Reinforcement, Maximum Flexural Steel		
		2.5	Design Problems on singly reinforced beams		
		2.6	Limit state analysis and design of doubly reinforced beam sections.	T1,R2	1
		2.7	Design Problems on doubly reinforced beams	T1,R2	1
		2.8	Limit state analysis and design of T-sections	T1,R2	1



		2.9	Effective width of flange –Behaviour-Analysis and Design	T1,R2	1	
		2.10	Limit state analysis and design of L-sections	T1,R2	1	
		2.11	Effective width of flange –Behaviour-Analysis and Design	T1,R2	1	
		2.12	Design of Flanged Sections (T&L)	T1,R2	1	
		Total			12	
III	CO 3: Design structures subjected to shear, bond and torsion. K3	3.1	Design for Shear, Torsion and Bond: Limit state analysis and design of section for shear	T1,R2	1	Chalk &Talk, PPT, Tutorial, Active learning
		3.2	Design of section for shear and torsion	T1,R2	1	
		3.3	concept of bond, anchorage	T1,R2	1	
		3.4	concept of development length	T1,R2	1	
		3.5	L.S. Code provisions	T1,R2	1	
		3.6	Design examples in simply supported beams, detailing.	T1,R2	1	
		3.7	Design examples in continuous beams, detailing.	T1,R2	1	
		3.8	Limit state design for service ability: Deflection	T1,R2	1	
		3.9	Limit state design for service ability: Deflection, cracking.	T1,R2	1	
		3.10	IS code provision	T1,R2	1	
		3.11	Design of beams (Design for flexure, shear. Checking for limiting Deflection)	T1,R2	1	
		3.12	Design of beams (Design for flexure, shear. Checking for limiting Deflection)	T1,R2	1	
		Total			12	
		4.1	Design of Compression members: Effective length of a column	T1,R2	1	
		4.2	Design of short columns- under axial	T1,R2	1	

IV	CO 4 : Design different type of compression members and footings. K3		loads, uniaxial bending		
		4.3	Design of short columns- under axial loads, and biaxial bending	T1,R2	1
		4.4	Design of long columns- under axial loads, uniaxial bending	T1,R2	1
		4.5	Design of long columns- under axial loads and biaxial bending	T1,R2	1
		4.6	Braced columns, Unbraced columns, IS code provisions	T1,R2	1
		4.7	Footings: Different types of footings, Design of isolated and combined footings-rectangular footings subjected to axial loads	T1,R2	1
		4.8	Rectangular footings subjected to axial loads, uni-axial bending moments.	T1,R2	1
		4.9	rectangular footings subjected to axial loads, bi-axial bending moments	T1,R2	1
		4.10	Design of isolated and combined footings- circular footings subjected to axial loads	T1,R2	1
		4.11	Design of isolated and combined footings- circular footings subjected to axial loads, uni-axial bending moments.	T1,R2	1
		4.12	Design of isolated footings- circular footings subjected to axial loads and bi-axial bending moments.	T1,R2	1
		Total			12

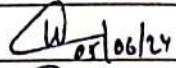
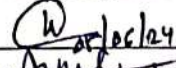
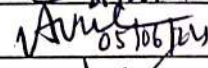



V	CO 5: Design of different types of slabs and detailing. K3	5.1	<b>Slabs:</b> Classification of slabs	T1,R2	1	Chalk &Talk, PPT, Tutorial, Active learning
		5.2	design of one - way slabs	T1,R2	1	
		5.3	Design problems one way slab using IS Coefficients	T1,R2	1	
		5.4	design of two - way slabs simply supported	T1,R2	1	
		5.5	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.6	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.7	Design of two - way slabs-simply supported and various edge conditions using IS Coefficients	T1,R2	1	
		5.8	Design problems on two way slabs	T1,R2	1	
		5.9	Design problems on two way slabs	T1,R2	1	
		5.10	Design of waist-slab staircase	T1,R2	1	
		5.11	Design problems on waist-slab staircase	T1,R2	1	
		5.12	IS code provisions	T1,R2	1	
		Total				
CUMULATIVE PROPOSED PERIODS				60		

**Text Books:**

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	S.S.Bhavikatti, 'Design of RCC Structural elements', 5 <sup>th</sup> Edition, New age international publishers, 2020.
2	A. K. Jain, 'Limit State Design', 7 <sup>th</sup> Edition, Nem Chand & Brothers-Roorkee, 2012
3	N. Subrahmanyam, 'Design of Reinforced concrete Structures', 4 <sup>th</sup> Edition CBS Publishers and Distributors Pvt Ltd, 2019
4	S. Unnikrishna Pillai & Devdas Menon 'Reinforced Concrete Structures', 3 <sup>rd</sup> Edition, Tata McGraw Hill, New Delhi, 2017.

<b>Reference Books:</b>	
<b>S.No.</b>	<b>AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION</b>
1	ArthusH.Nilson, David Darwin, and Chorles W. Dolar, 'Design of concrete struc 3rd Edition, Tata McGrawHill, 2005.
2	Park and Pauley, John Wiley and Sons, 'Reinforced Concrete Structures', John V Sons, Inc.
<b>Code Books:</b>	
<b>S.No.</b>	<b>Code Book</b>
1.	IS 456 : 2000
2.	IS 875
3.	SP : 16
<b>Web Details</b>	
1	<a href="https://nptel.ac.in/courses/105/105/105105105/">https://nptel.ac.in/courses/105/105/105105105/</a>

		Name	Signature with Date
i.	Faculty	D.Satish	 05/06/24
ii.	Course Coordinator	D.Satish	 05/06/24
iii.	Module Coordinator	A.Venkata Krishna	 05/06/24
iv.	Programme Coordinator	G.V.L.N.Murthy	

  
Principal